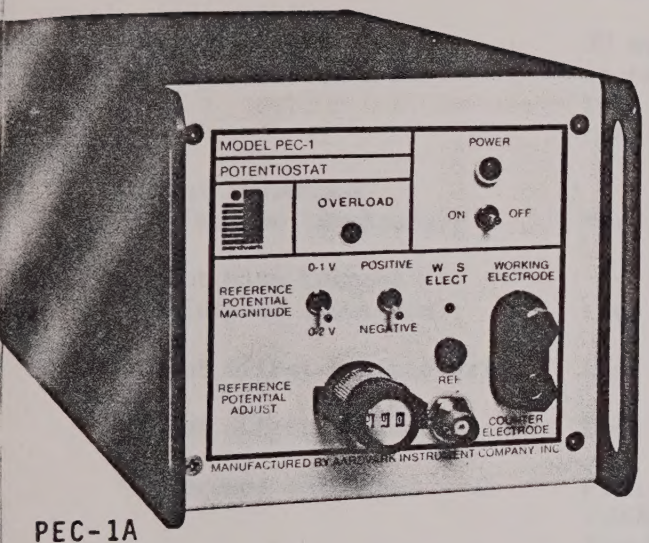
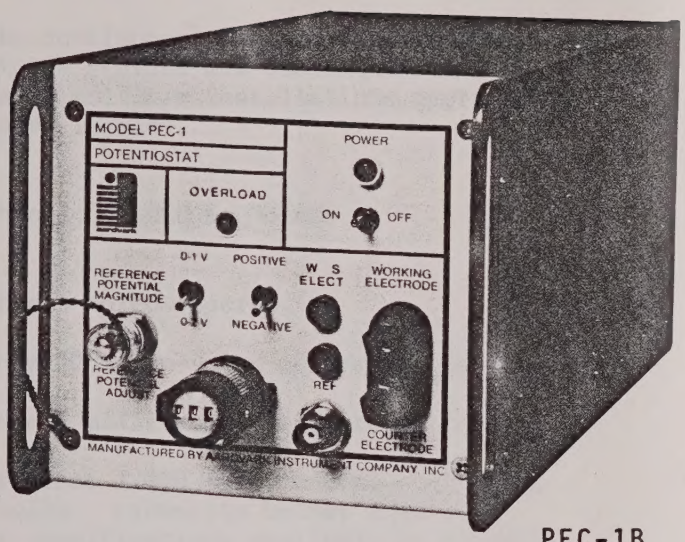
OPERATIONAL MANUAL



PEC-1A



PEC-1B

PEC-1A MODULAR POTENTIOSTAT
PEC-1B MODULAR POTENTIOSTAT WITH
- EXTERNAL REFERENCE INPUT

Aardvark Instruments

FLOYD BELL ASSOCIATES INC.
897 Higgs Ave.
P.O. Box 12327
Columbus, Ohio 43212-0327
Phone: (614) 488-3193
TWX: 810-482-1763

This instrument is a PEC-1A ____

PEC-1B ✓

Manual sent with instrument

Serial Number 148

Date 9-21-82

Final Check By TC

SPECIFICATIONS

Output Voltages:	Light load = ±40 Volts 1 ampere = ±30 Volts
Output Power:	30 watts continuous with unrestricted air flow at heatsink (forced air cooling recommended in rack mount multiple installations operated at high power levels).
Input Impedance (Reference Electrode):	More than 1,000,000 meg-ohms.
Input Bias Current (Reference Electrode):	Less than 5 pico-amperes.
Input Offset Voltage Drift:	Less than 50 micro-volts per degree centigrade.
Input Offset Voltage:	Less than 2 milli-volts, adjustable to zero.
Reference Voltages:	Plus or minus 1.000 volt, and plus or minus 2.000 volts. Linearity better than .2%. Tighter specifications available on request.
Reference Voltage Drift (Total System Drift Error):	.01% ±50 micro-volts per degree centigrade.
Overload:	Overload indication lamp for monitoring loss of potential control.
Power Requirement:	110 VAC, 50/60 Hz., 1.0 A MDL fuse.

CALIBRATION

A. Offset Adjustment

1) Make the following set-up:

a) Connect the reference electrode to the working electrode.

b) Connect an accurate volt-meter to reference potential output.

c) Set the volt-meter to read milli-volts D.C.

2) Apply power and set the instrument to standby. Adjust P1 (Figure 1) for a zero reading on the volt-meter.

B. External Offset Adjustment (PEC-1B Only)

1) Change set-up as follows:

a) Be sure the shorting cap is in place on the external reference potential input.

b) Use the same connection of the volt-meter as in Step 1.

c) Connect the reference electrode to the counter electrode.

d) Adjust the internal reference dial to 000 (zero).

2) Apply power in the full-on mode and adjust P3 (Figure 2) for zero reading on the volt-meter.

C. Output Voltage Adjust

1) Change set-up as follows:

a) Maintain the short on the external reference potential input (PEC-1B only).

b) Connect the reference electrode to the counter electrode.

c) Set positive/negative switch on negative position.

d) Set 0-1/0-2 switch on 0-2 position.

e) Turn the internal reference dial to 999 (all the way up).

f) Keep the volt-meter connected to the reference potential output and set it to measure 2 volts D.C.

2) Turn the on/off switch to the on position and adjust P1 (Figure 2) for 2.000 reading on the volt-meter.

3) Maintain the same connection as in Step C1 but change the positive/negative switch to positive.

4) With the unit remaining in the on position adjust P2 (Figure 2) for 2.000 volts.

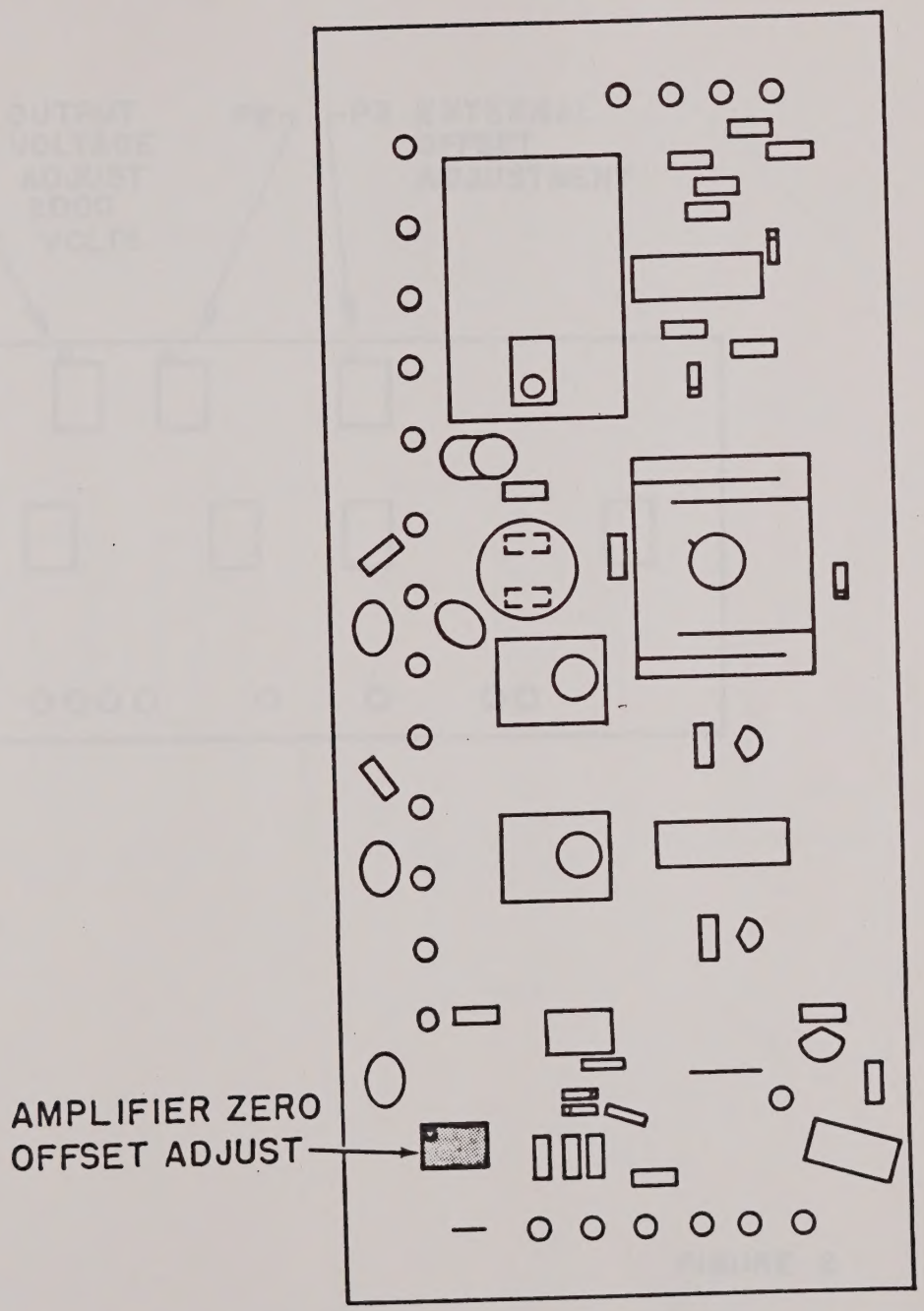


FIGURE 1

PREAMPLIFIER

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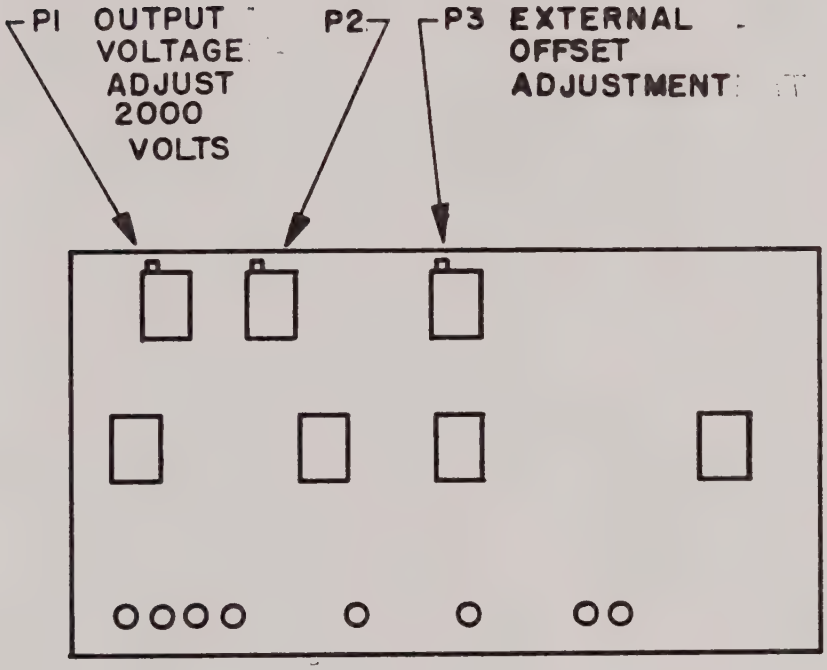


FIGURE 2

	FLOYD BELL ASSOCIATES INC. 1920 Northwest Blvd. P.O. Box 12327 Cols., Ohio 43212 Phone: 614 488-3193		MATERIAL
DATE			FINISH
	REFERENCE BOARD		DWG. NO. A-191
N. MARK 3-24-77	SCALE	TOLS.	

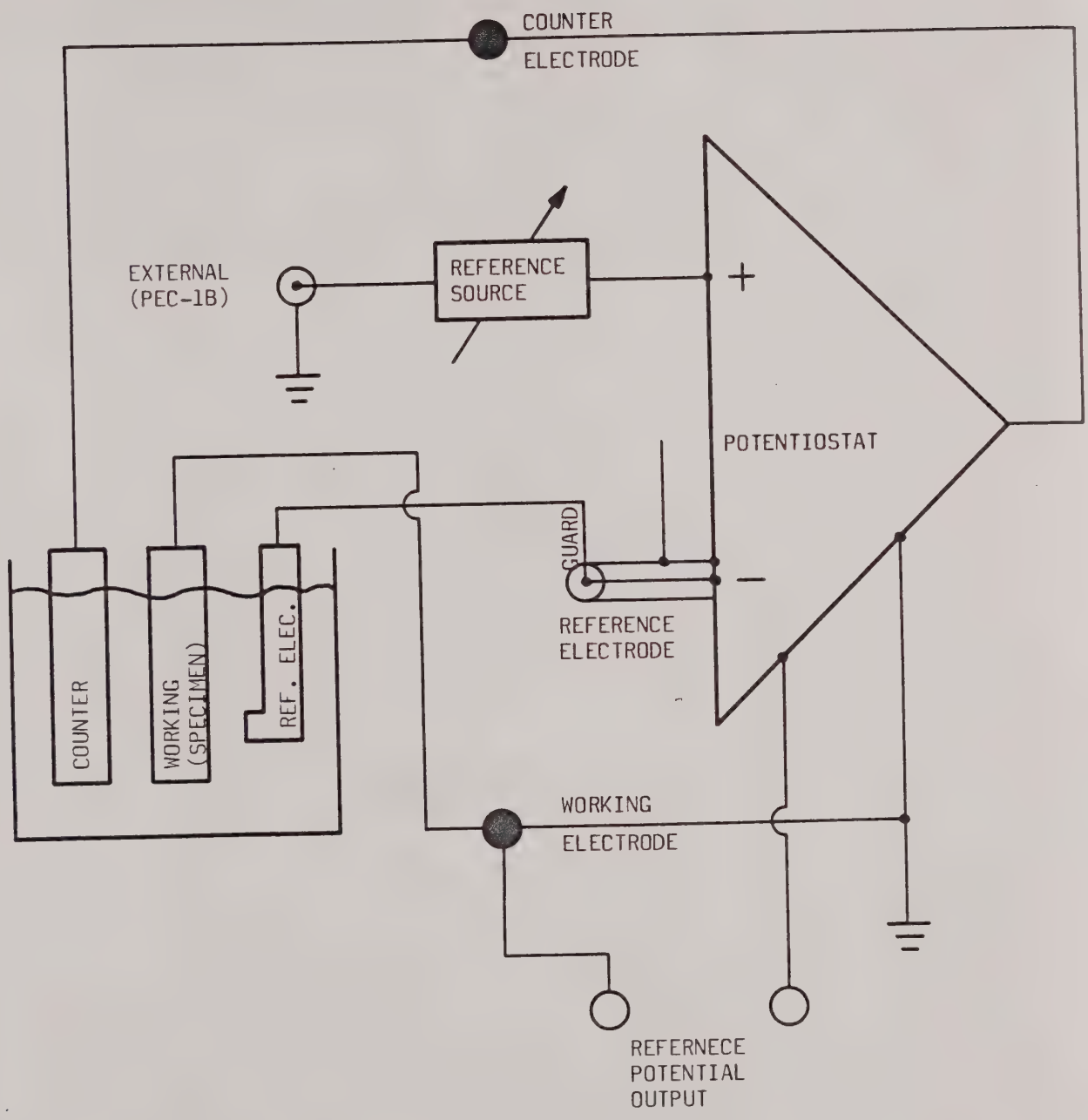


FIGURE 3

		FLOYD BELL ASSOCIATES INC. 1920 Northwest Blvd. P.O. Box 12327 Cols., Ohio 43212 Phone: 614 488-3193	MATERIAL
			FINISH
REV.	DATE	GENERAL POTENTIOSTATIC OPERATION	
APR.			DWG. NO. A-185
CKD.			
DRN.		SCALE / TOLS.	

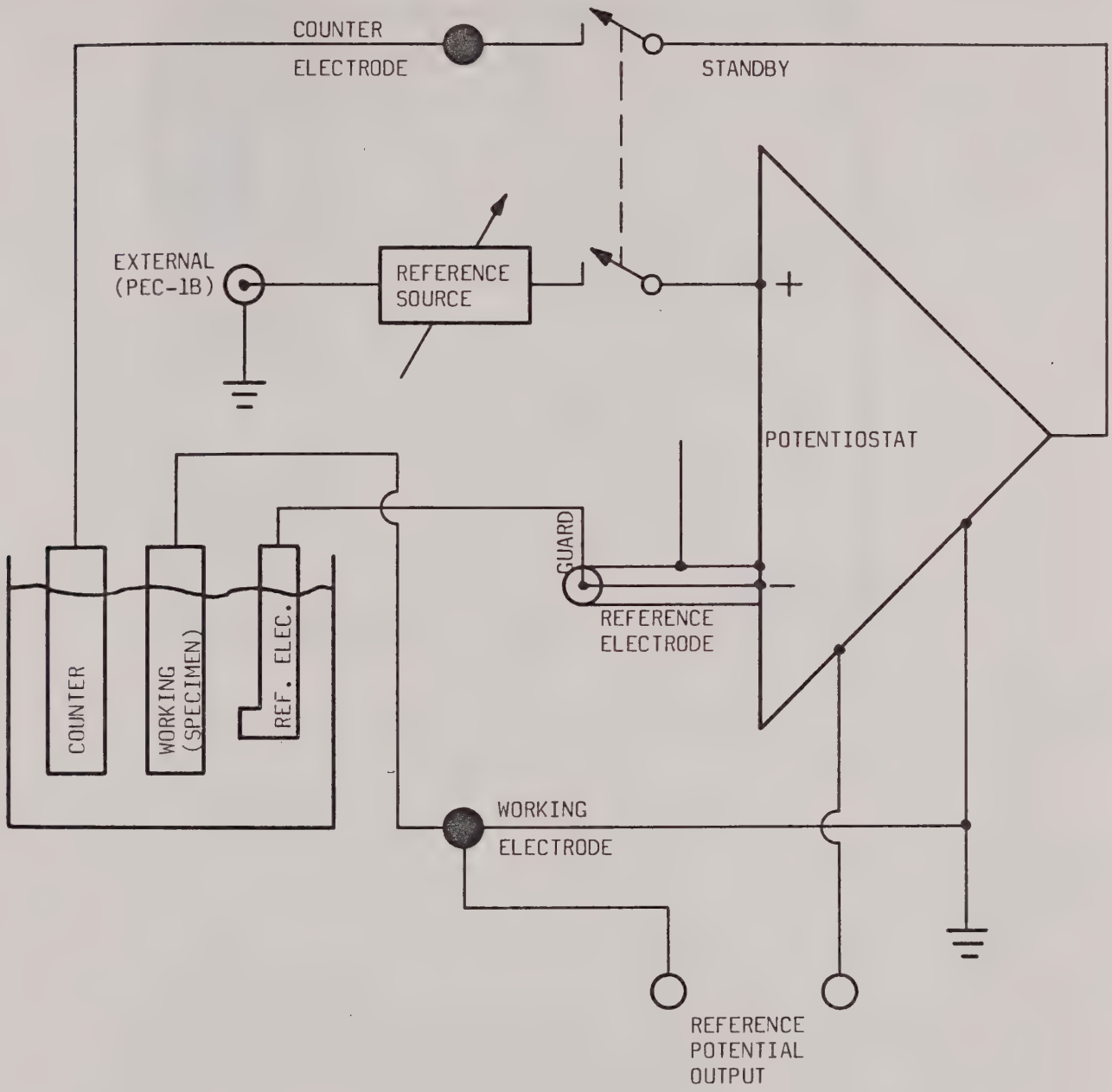


FIGURE 4

		FLOYD BELL ASSOCIATES INC. 1920 Northwest Blvd. P.O. Box 12327 Cols., Ohio 43212 Phone: 614 488-3193	MATERIAL
	DATE		FINISH
		OPEN CIRCUIT POTENTIAL OPERATION	DWG. NO. A-186
		SCALE / TOLS.	

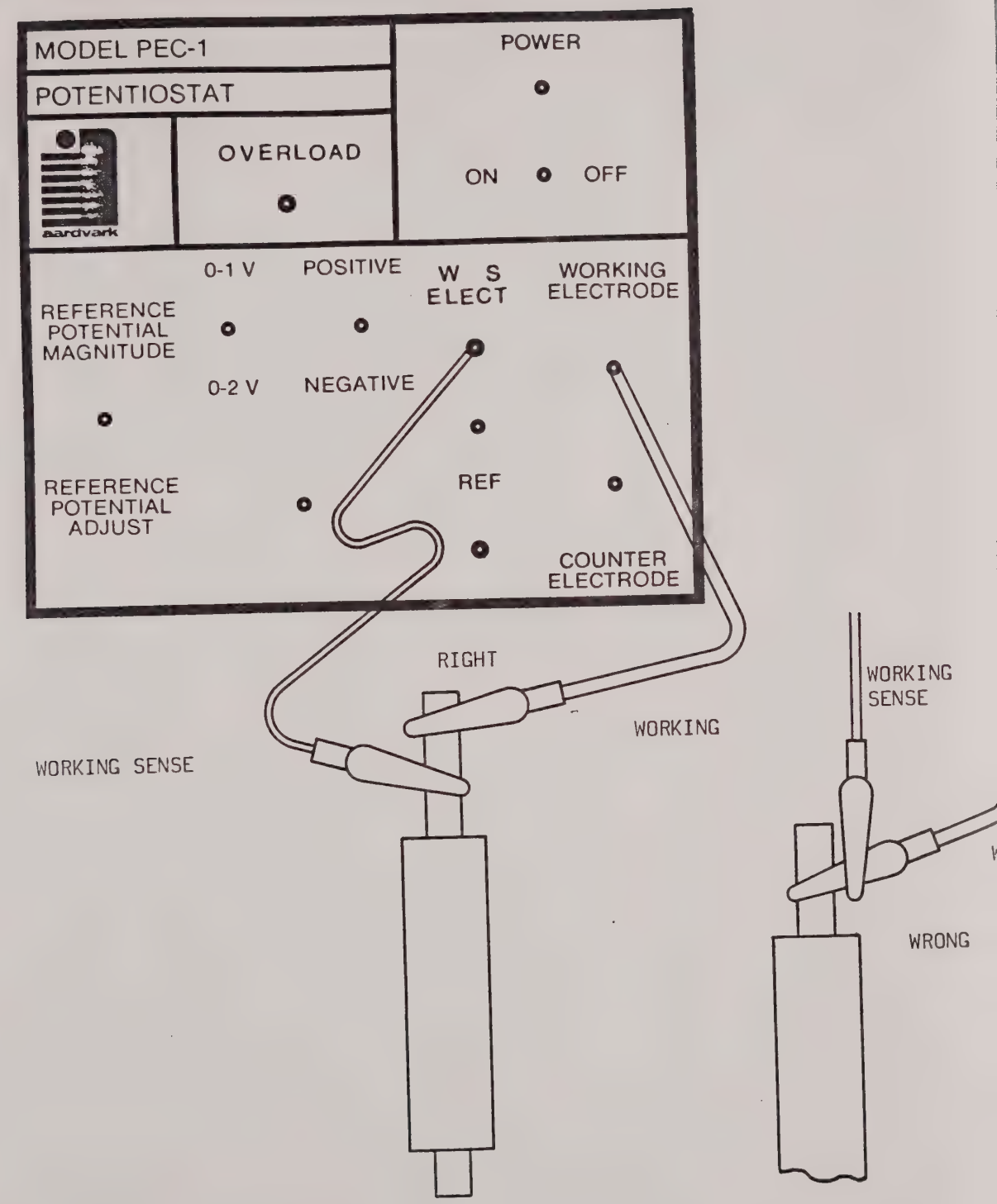
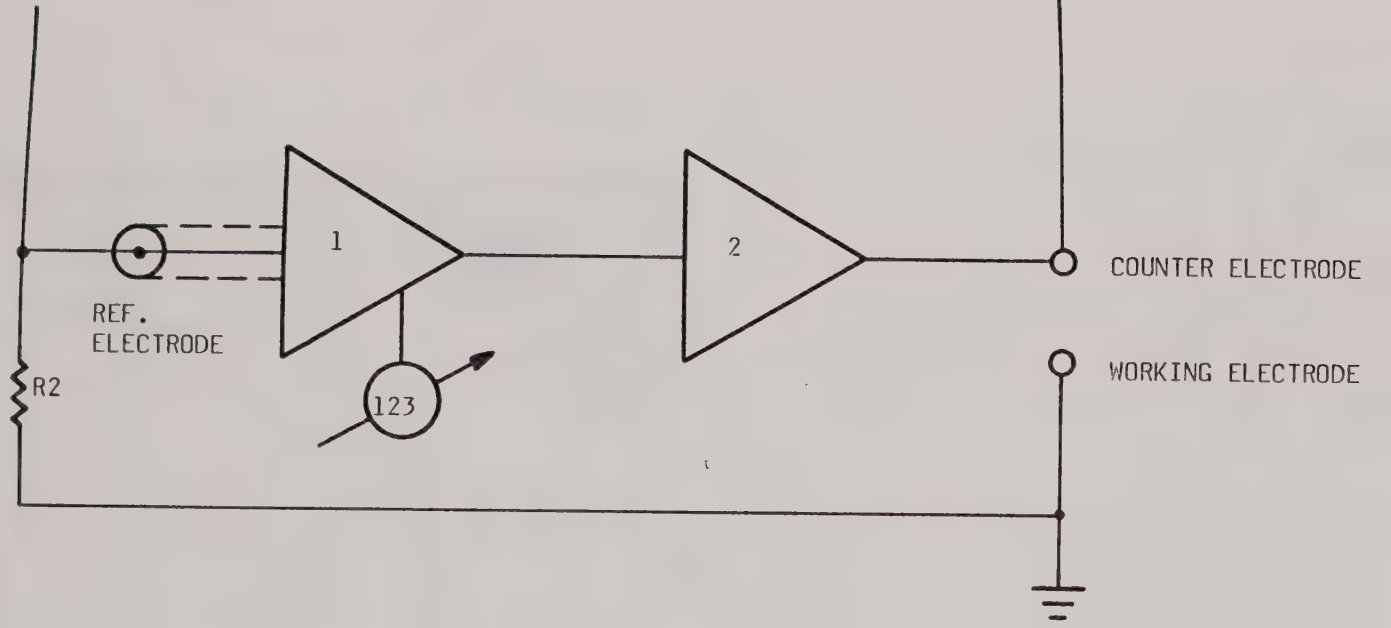


FIGURE 5

PROPER AND IMPROPER CONNECTIONS OF THE WORKING SENSE ELECTRODE (OPTIONAL)

WORKING SENSE ELECTRODE



DESIRED OUTPUT	R1	R2
0-1, 0-2	0 (SHORT)	(OPEN)
0-5, 0-10	8K	2K
0-10, 0-20	9K	1K
0-20, 0-MAX	19K	1K

$$\text{OUTPUT} = \frac{\text{REF} \times R1 + R2}{R2}$$

FIGURE 6 CONNECTIONS FOR RECTIFIER (POWER SUPPLY) OPERATION

$$I = \frac{V}{R}$$

WHERE

I - CURRENT OUT

V - VOLTAGE OUT OF POTENTIOSTAT

R - RESISTANCE SELECTED BY THE RANGE SWITCH 1 to 1M

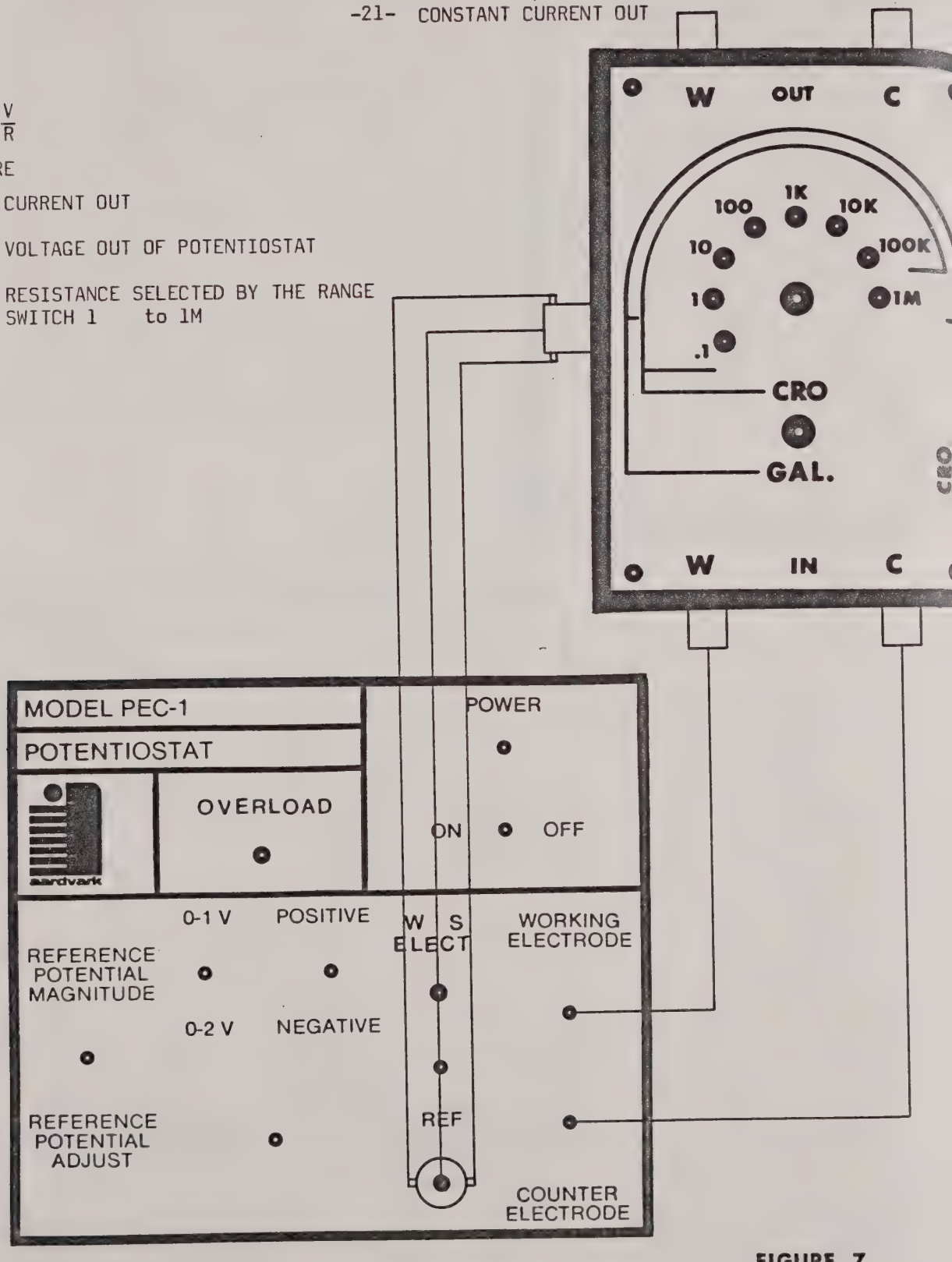


FIGURE 7

CRO GALVANOSTATIC OPERATION

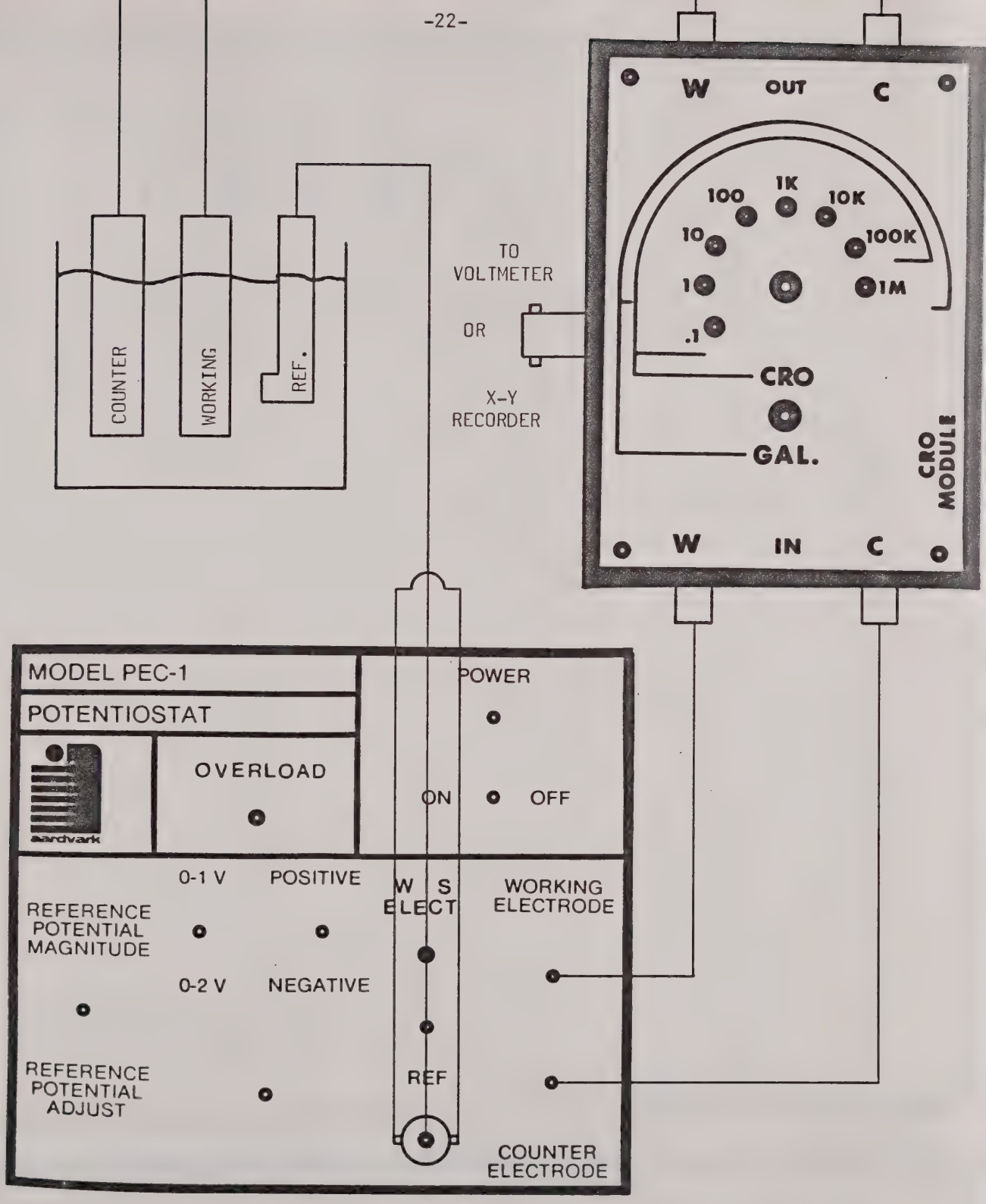
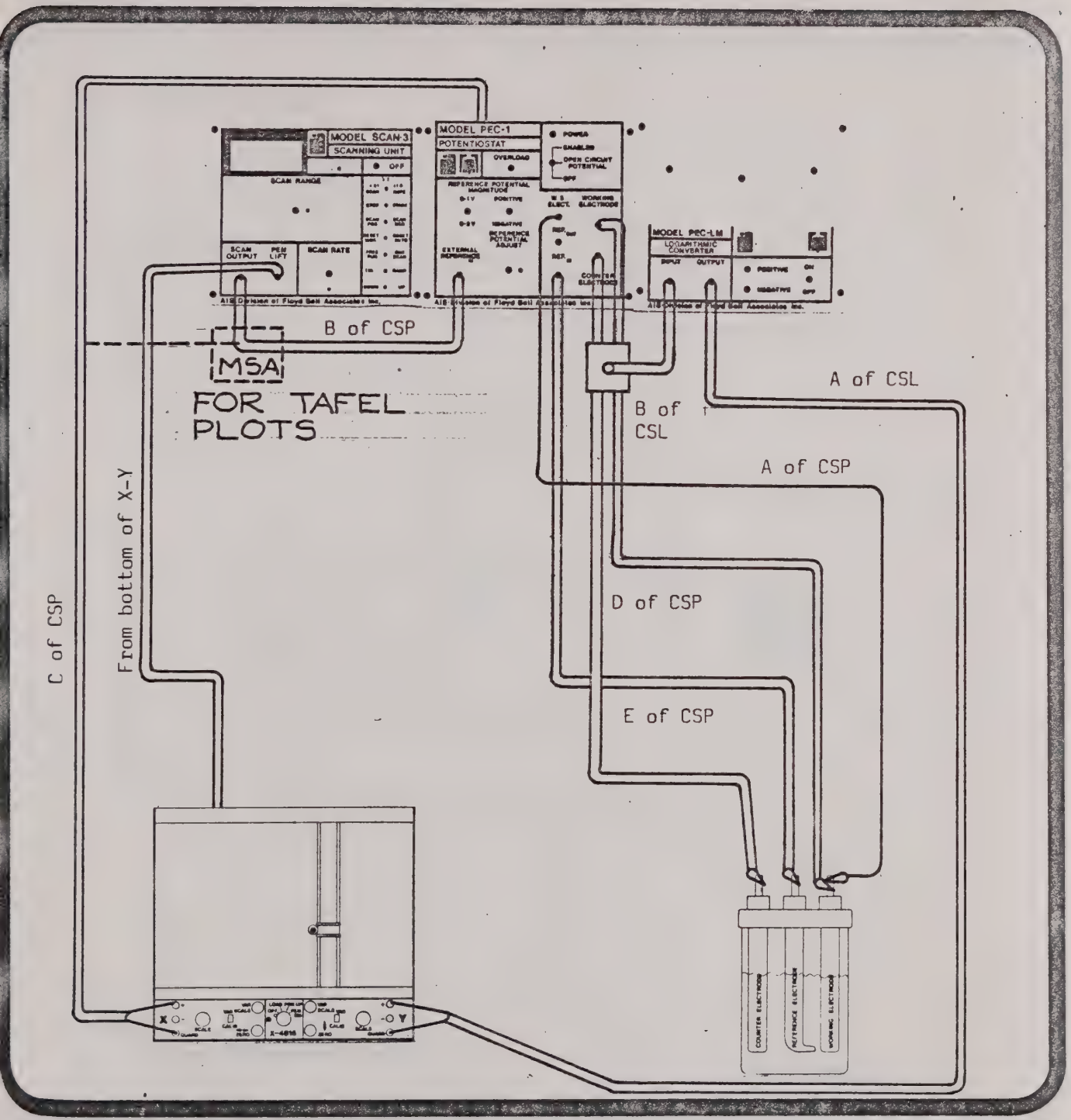


FIGURE 8

OUTPUT CURRENT MEASUREMENT



TITLE: SYSTEM #5
ANODIC POLARIZATION & TAFEL PLOT

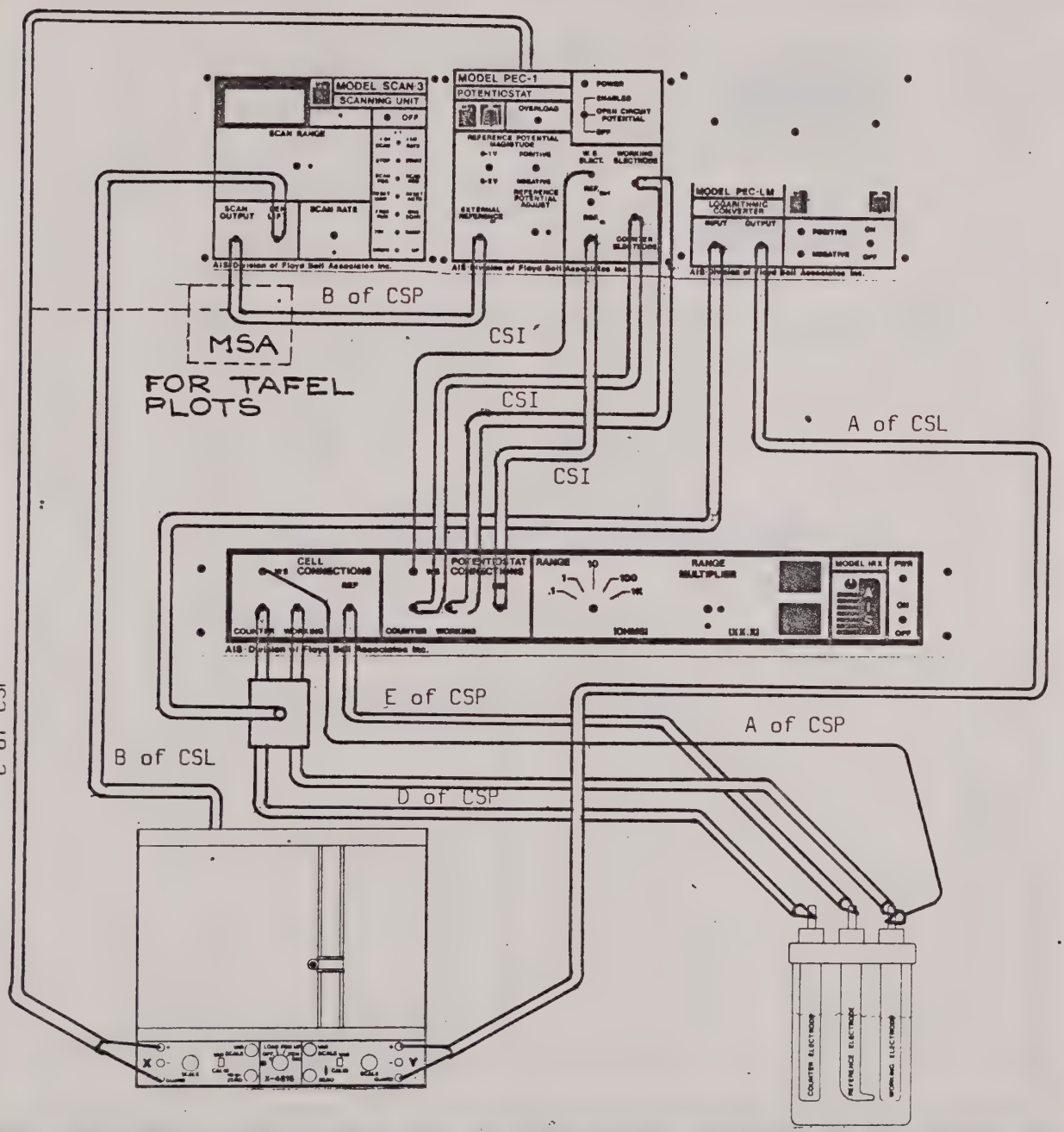
SCALE: .3X

DRAWN BY: TH 8-21-81

DRAWING NO. A-490

FLOYD BELL ASSOCIATES, INC.·AIS
P. O. Box 12327 Columbus, Ohio 43212
(614) 488-3193 TWX:810-482-1763

N76876



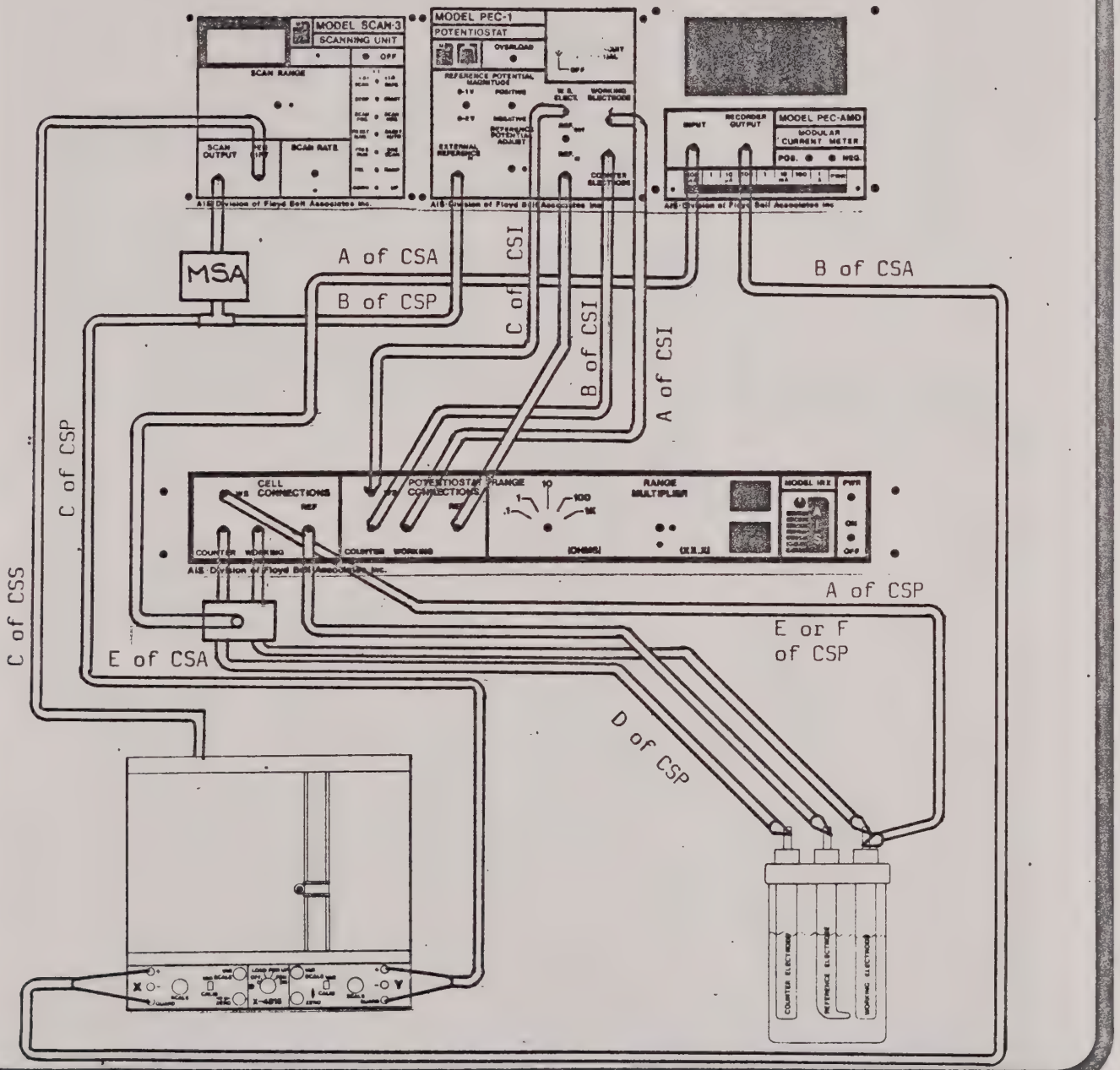
TITLE: SYSTEM #6 ANODIC POLARIZATION — AND TAFEL PLOT W/IR Compensation

SCALE: .3X

DRAWN BY: TH 8-21-81

DRAWING NO. A-491

FLOYD BELL ASSOCIATES, INC. · AIS
P. O. Box 12327 Columbus, Ohio 43212
(614) 488-3193 TWX: 810-482-1763



TITLE: LINEAR POLARIZATION

SCALE: .3X

DRAWN BY: TH 8.2181

DRAWING NO. A-492

FLOYD BELL ASSOCIATES, INC. · AIS
P. O. Box 12327 Columbus, Ohio 43212
(614) 488-3193 TWX: 810-482-1763

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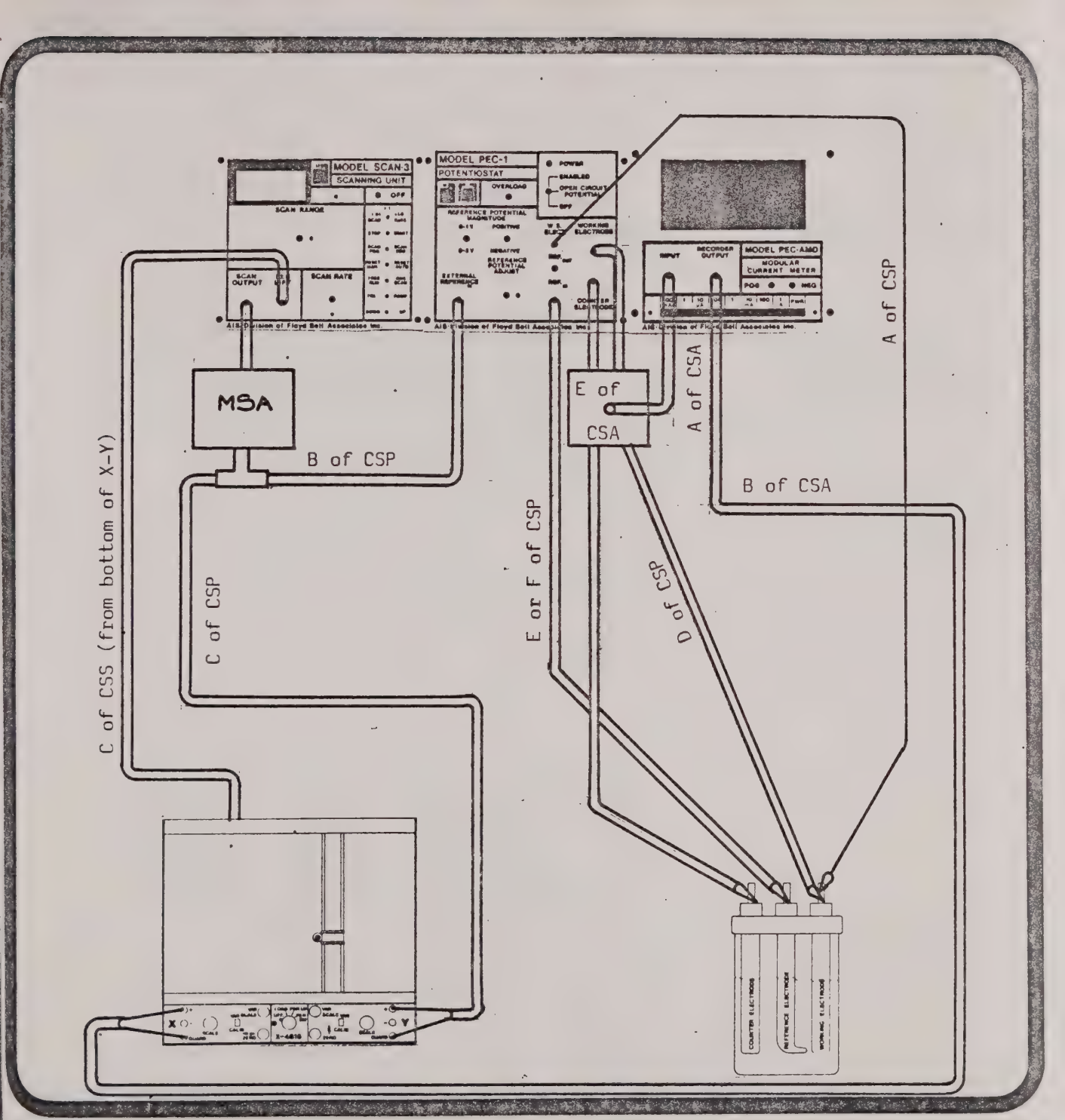

TITLE:

LINEAR POLARIZATION

SCALE: 3X

DRAWN BY: TH 8-21-81

DRAWING NO. A-493

FLOYD BELL ASSOCIATES, INC. · AIS
P. O. Box 12327 Columbus, Ohio 43212
(614) 488-3193 TWX: 810-482-1763

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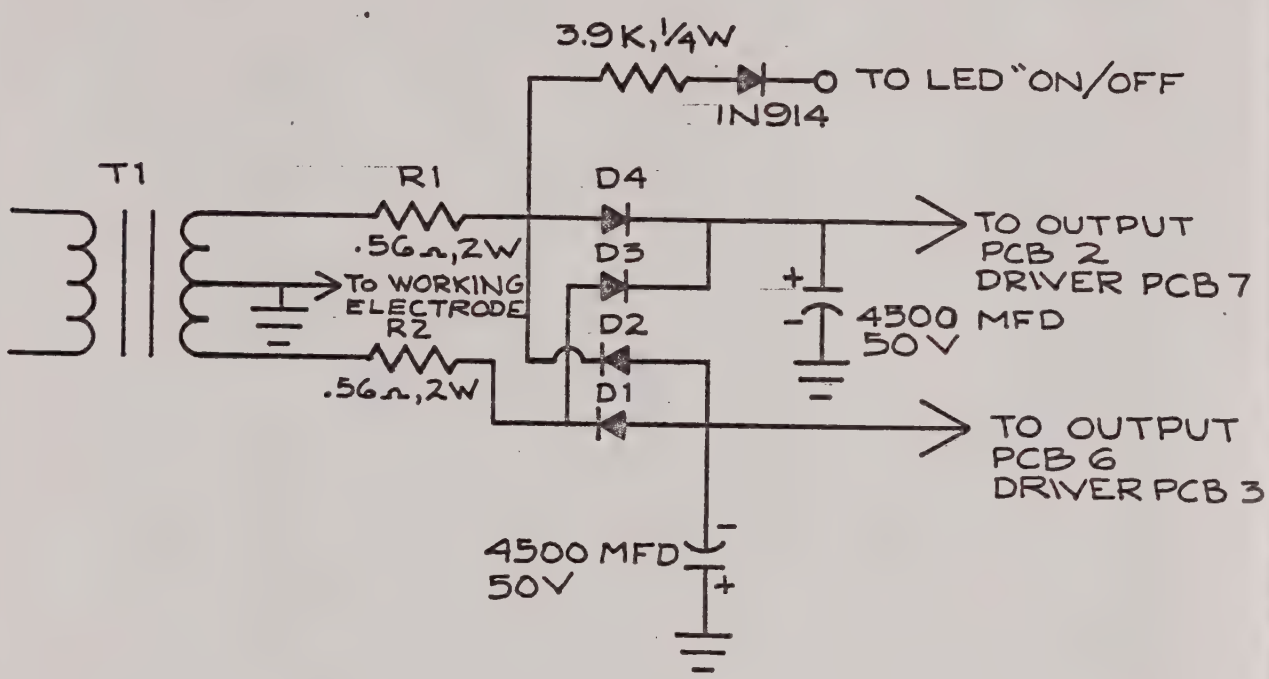


PEC-1	T1	DP 241-7-56
PEC-3	T1	36-4
PEC-1	D1-4	1N5624
PEC-3	D1-4	MR 751
PEC-3	R1 & 2	SHORTED

TITLE:

PEC-1, PEC-3 Power Board

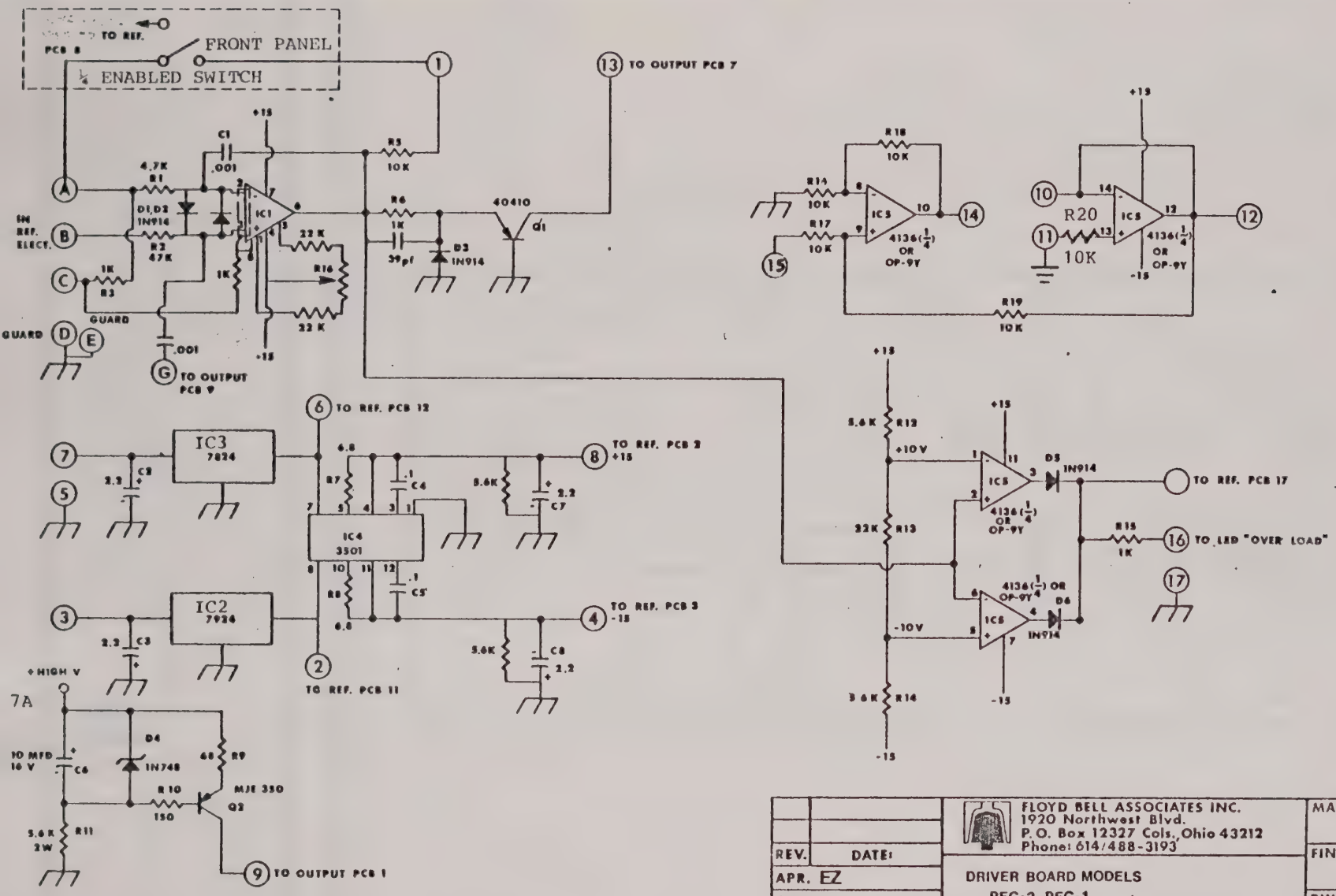
SCALE:

DRAWN BY: TH 11·30·81

DRAWING NO. A-507

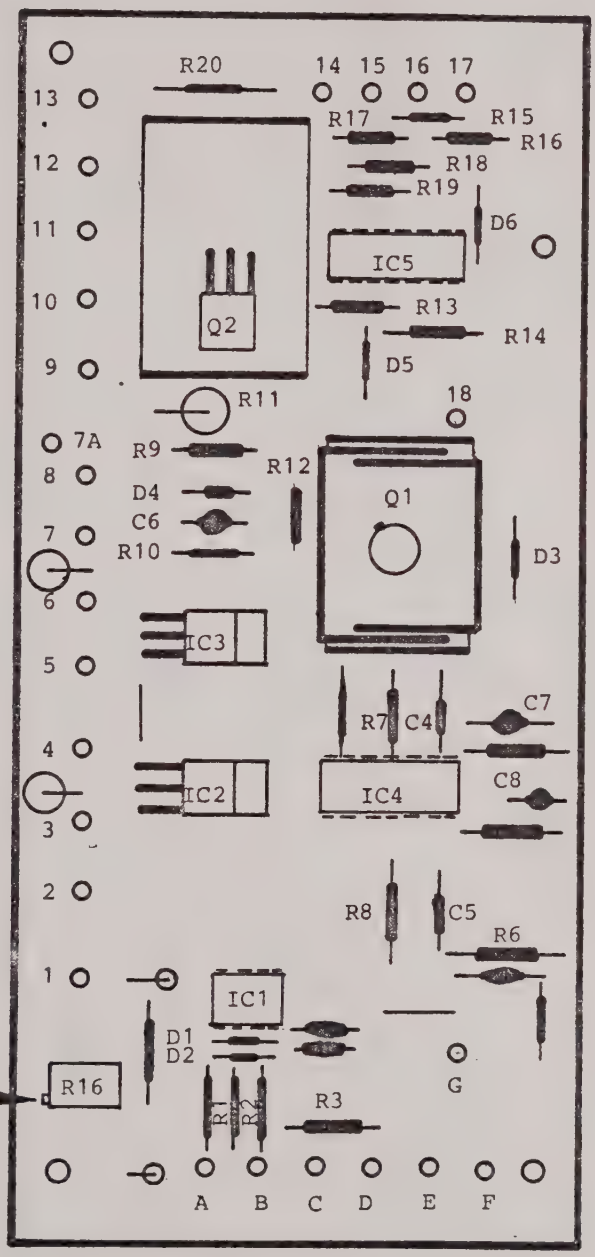
FLOYD BELL ASSOCIATES, INC.·AIS
P. O. Box 12327 Columbus, Ohio 43212
(614) 488-3193 TWX:810-482-1763

N76876



REV.	DATE:	FLOYD BELL ASSOCIATES INC. 1920 Northwest Blvd. P. O. Box 12327 Cols., Ohio 43212 Phone: 614/488-3193	MATERIAL
APR. EZ		DRIVER BOARD MODELS PEC-3, PEC-1	FINISH
CKD			DWG. NO.
DRN. TH 11-30-8		SCALE: TOLS.	B-508

IC 1 - BB 3527 BM
IC 2 - MC 7924
IC 3 - MC 7824
IC 4 - 3501
IC 5 - 4136
Q_1 - 40410
Q_2 - MJE 350



P1 — Amplifier Zero Offset Adjust

TITLE:

PEC 1, PEC 3 DRIVER BOARD MODELS

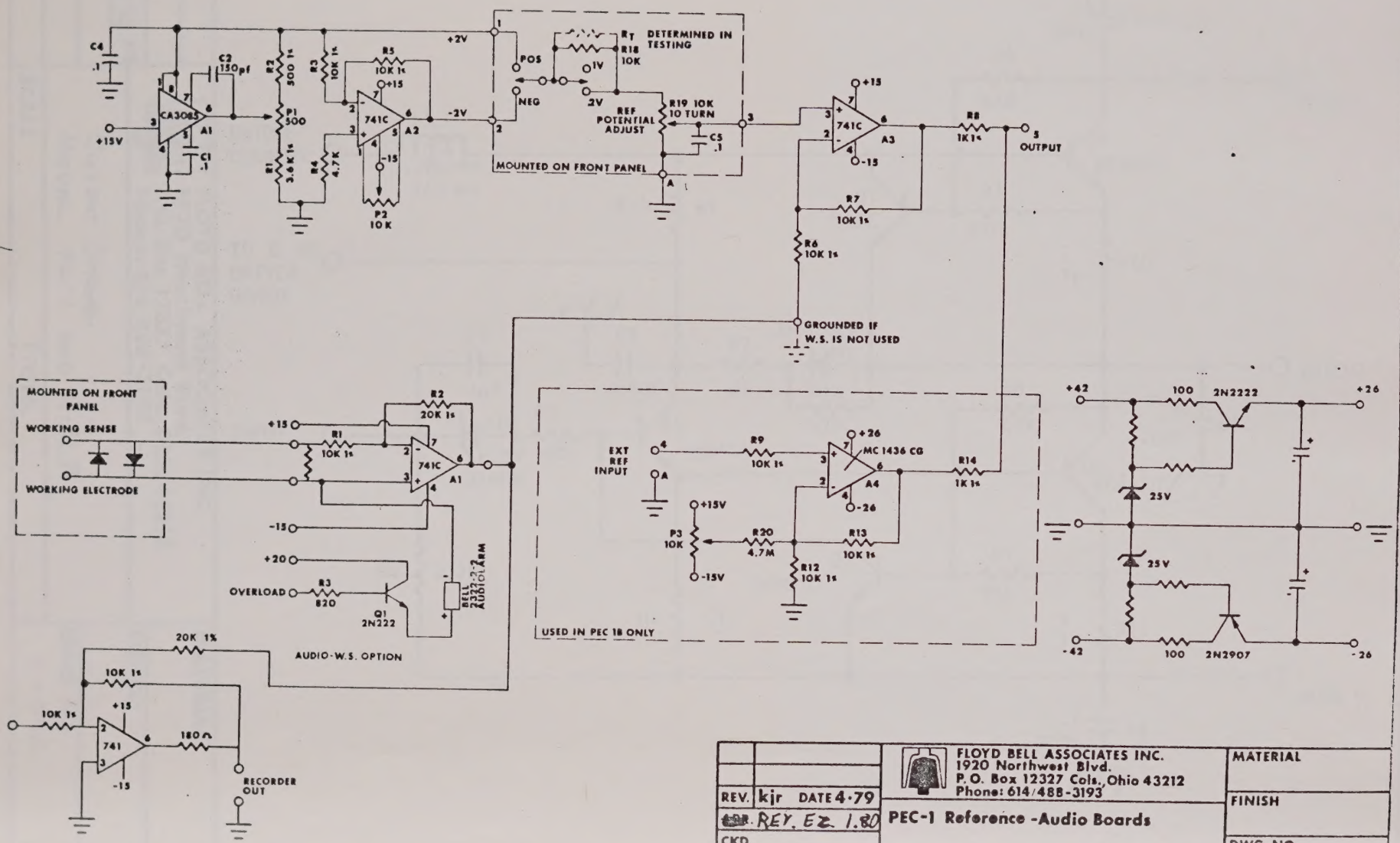
SCALE: FULL

DRAWN BY: TH 12-1-81

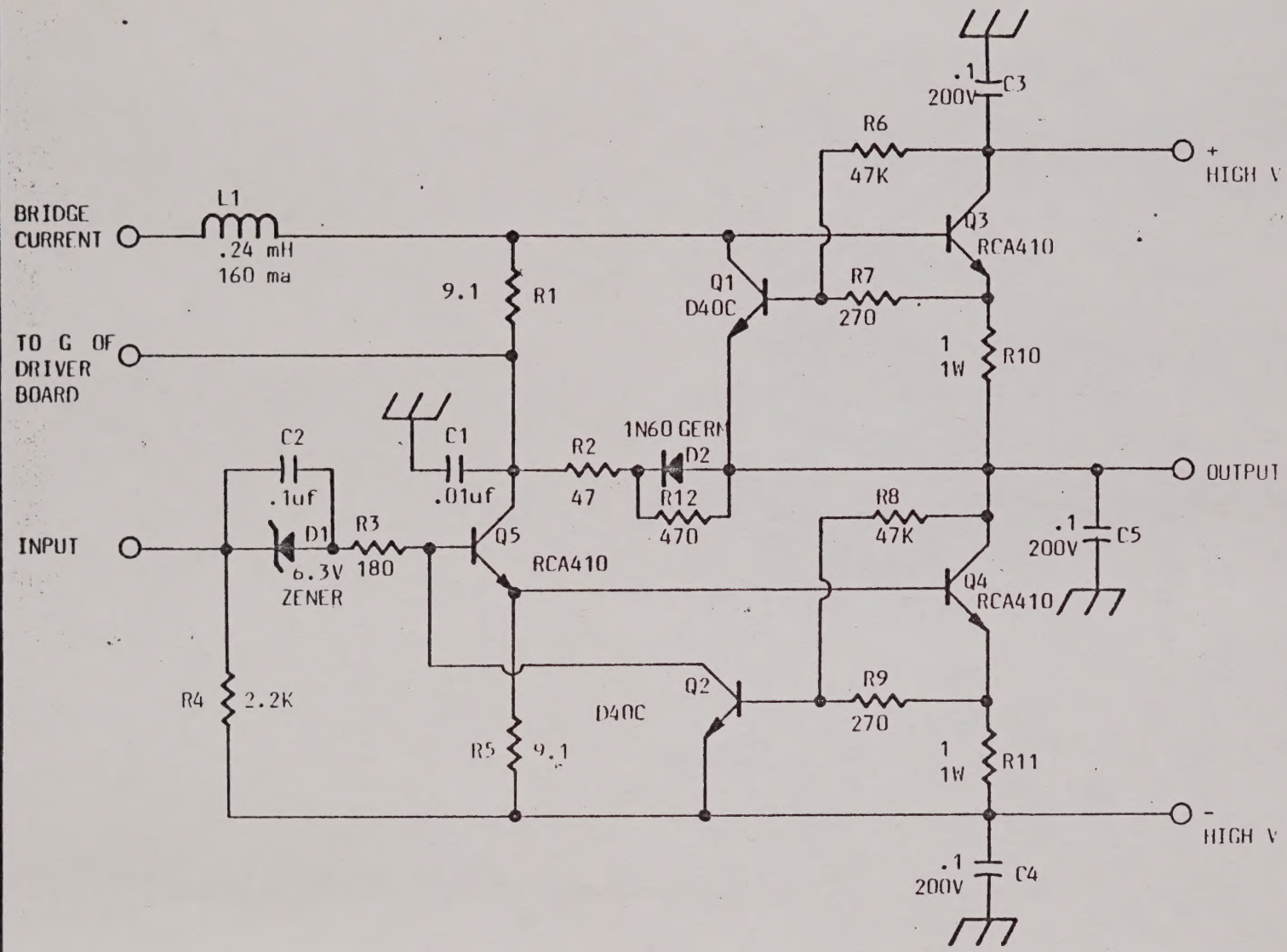
DRAWING NO. A-510

FLOYD BELL ASSOCIATES, INC.·AIS
P. O. Box 12327 Columbus, Ohio 43212
(614) 488-3193 TWX:810-482-1763

N76876



REV. kjr DATE 4-79	FLOYD BELL ASSOCIATES INC. 1920 Northwest Blvd. P. O. Box 12327 Cols., Ohio 43212 Phone: 614/488-3193	MATERIAL	
~~DR~~ REV. EZ 1.80	PEC-1 Reference -Audio Boards	FINISH	
CKD.		DWG. NO.	B-241
DRN. mwg	SCALE	TOLS.	



DRN.	REV.			
CKD.	DATE 4-18-79			
APR.				
SCALE		FLOYD BELL ASSOCIATES INC. 1920 Northwest Blvd. P.O. Box 12327 Cols., Ohio 43212 Phone: 614-488-3193		MATERIAL
TOLS.		OUTPUT STAGE MODEL PC-1 AND V-2LR		FINISH
				DWG. NO. A-352